



Federal University  
of Alagoas | Brazil



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EDUCAÇÃO



# NEES

NÚCLEO DE EXCELENCIA EM TECNOLOGIAS SOCIAIS

**W3C Publishing WG  
Presentation  
November 5th, 2025**

# PNLD

Programa Nacional do  
Livro Didático

**Brazilian Textbook Program  
The LIP Project**

**Prof. Breno Duarte  
NEES/UFAL**



NEES

# Who is NEES?

The Center for Excellence in Social Technologies (**NEES**) is a research & development group located in **Maceió** (Alagoas), Brazil





# Who is NEES?

Our main research efforts are related to  
**educational equity and digital transformation**





# Partnership with the PNLD

(National Textbook Program)

## Who is NEES?

NEES supports most stages of the assessment process and PNLD-related textbook acquisition

Our platforms support more than a thousand publishers, more than 10 thousand evaluators and 180 thousand schools in the process of choosing textbooks with teachers

We support team formation, screening, pedagogical evaluation, enrollment forecasting, and help to streamlining the whole process.

+ 180k  
schools  
~ 40 M  
students

+ 1k  
Publishers

+ 10k  
evaluators

# PNLD - What is it?



**pnld**

- The **PNLD** is Brazil's **National Textbook Program**, managed by the **Ministry of Education (MEC)** and **FNDE - National Fund for the Development of Education**
- It is one of the world's largest public initiatives for textbook distribution, ensuring that all students in public schools receive **free, high-quality educational materials**
- The program covers **all stages of basic education** (from early childhood to high school)
- Aims to promote **equity, accessibility, and inclusion** by selecting, evaluating, purchasing, and distributing approved textbooks and digital learning resources to millions of students and teachers across the country

# PNLD - What is it?



pnld

- Recent editions of the PNLD have expanded to include **digital and accessible formats**, aligning with national policies on **inclusive education** and the **digital transformation of learning materials**
- NEES started working on both the definition of a proper format as well as on the development of multiplatform (desktop / web / mobile) readers to include them into the PNLD Workflow

# PNLD | Stakeholders



Publishers



Pedagogical  
Evaluators  
(MEC)



Technical  
Analysts

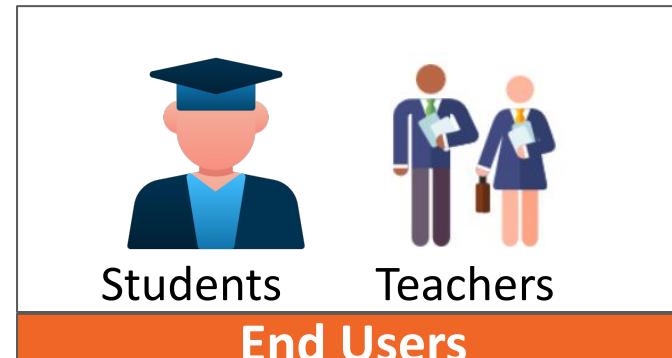


Accessibility  
Analysts



Resource  
Analysts

## Production and Evaluation



# PNLD | Stakeholders

## Publishers

Produce educational materials, including printed books and e-textbooks with multimedia resources, to ensure high-quality educational content for students;

## Evaluators from MEC (Ministry of Education)

Review educational content, ensuring that it meets the educational and curriculum standards established by MEC;

## Attribute analysts

Check editorial elements of educational materials, ensuring that all physical and visual components meet the standards and specifications established in the public notice;

## Accessibility analysts

Ensure that educational materials are accessible to all students, promoting educational inclusion;

## Resource analysts

Evaluate and qualify the resources used in the production of educational materials.

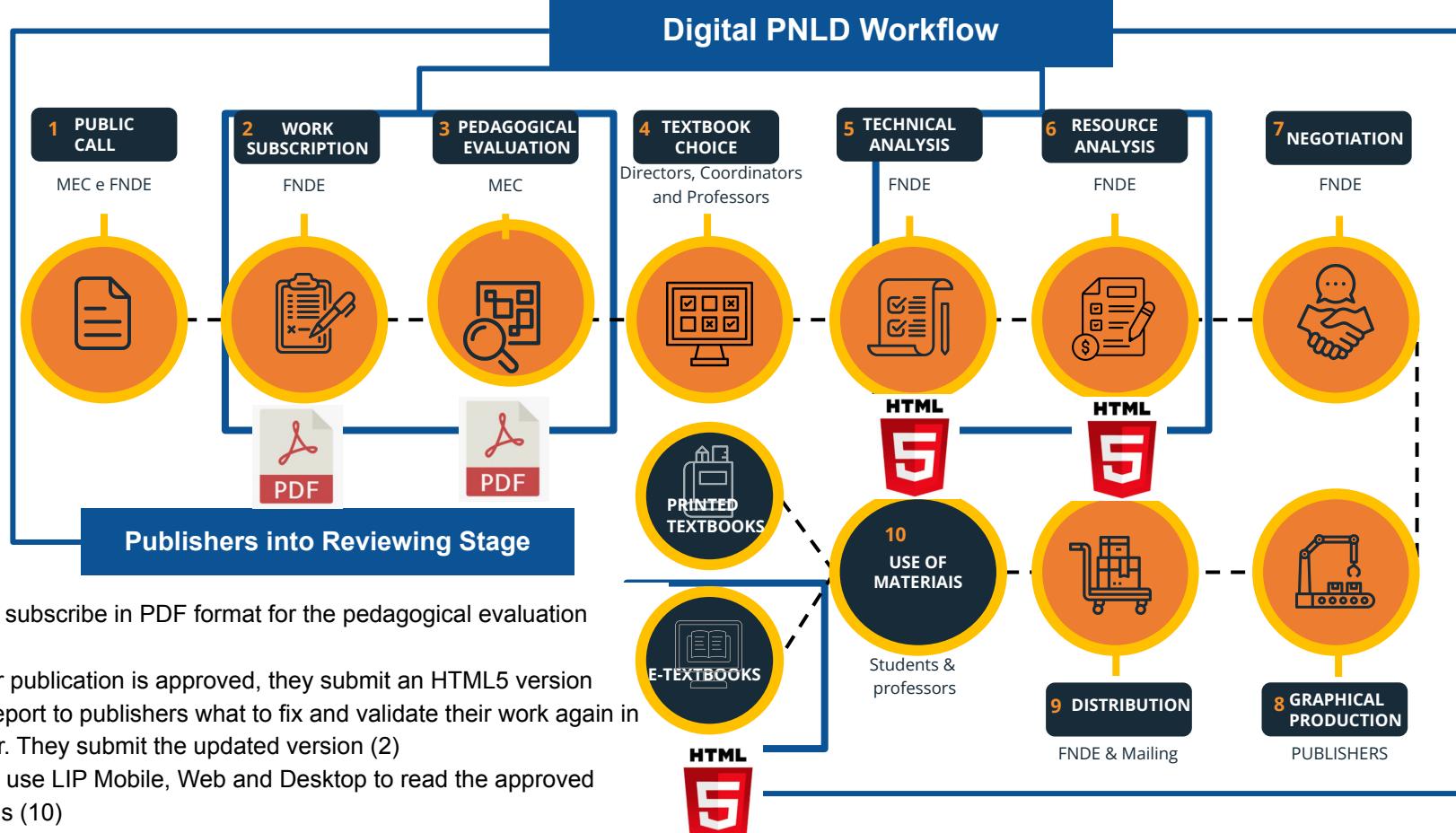
# PNLD Workflow



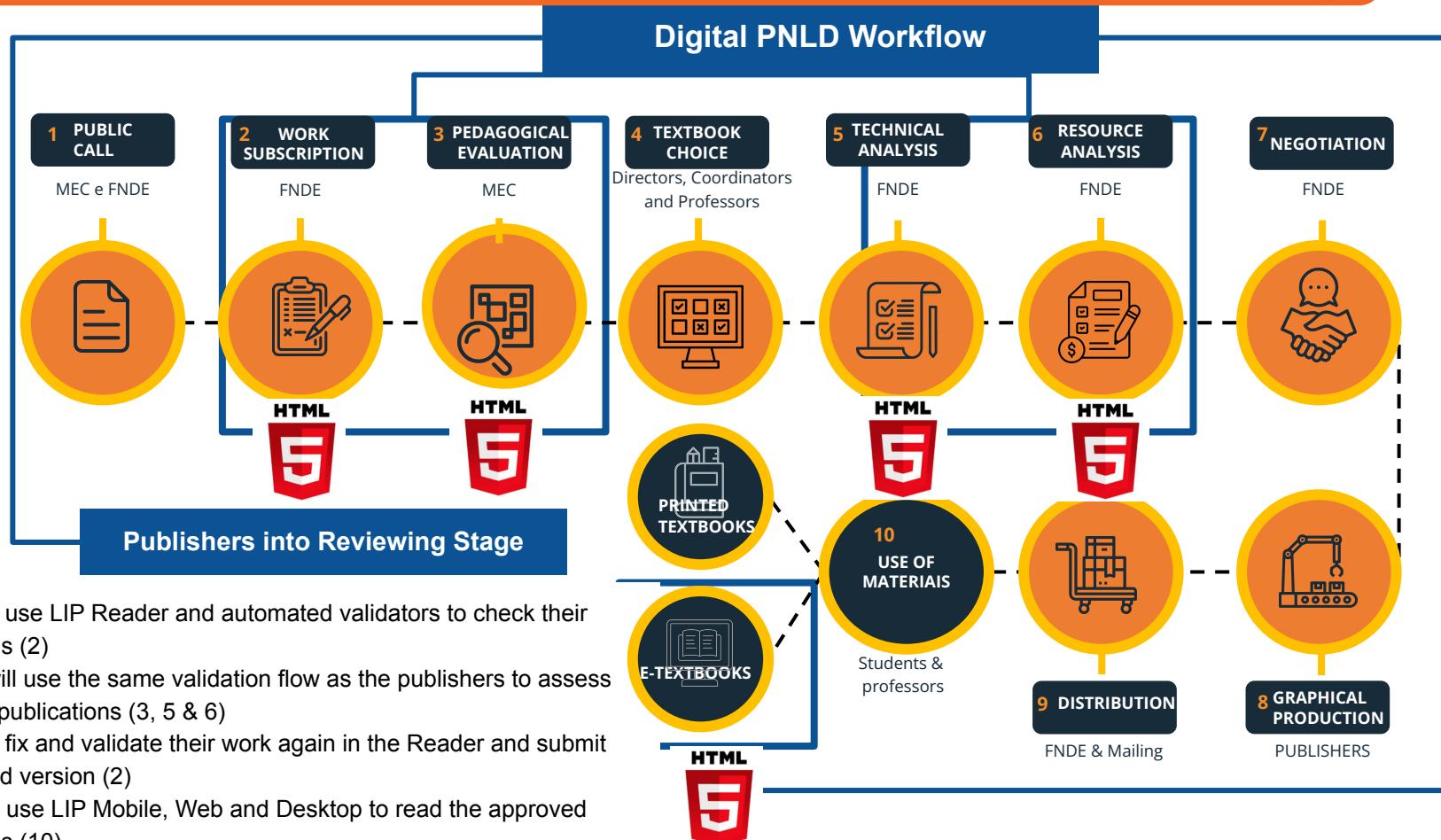
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ESTADO DE SANTA CATARINA

## Digital PNLD Workflow

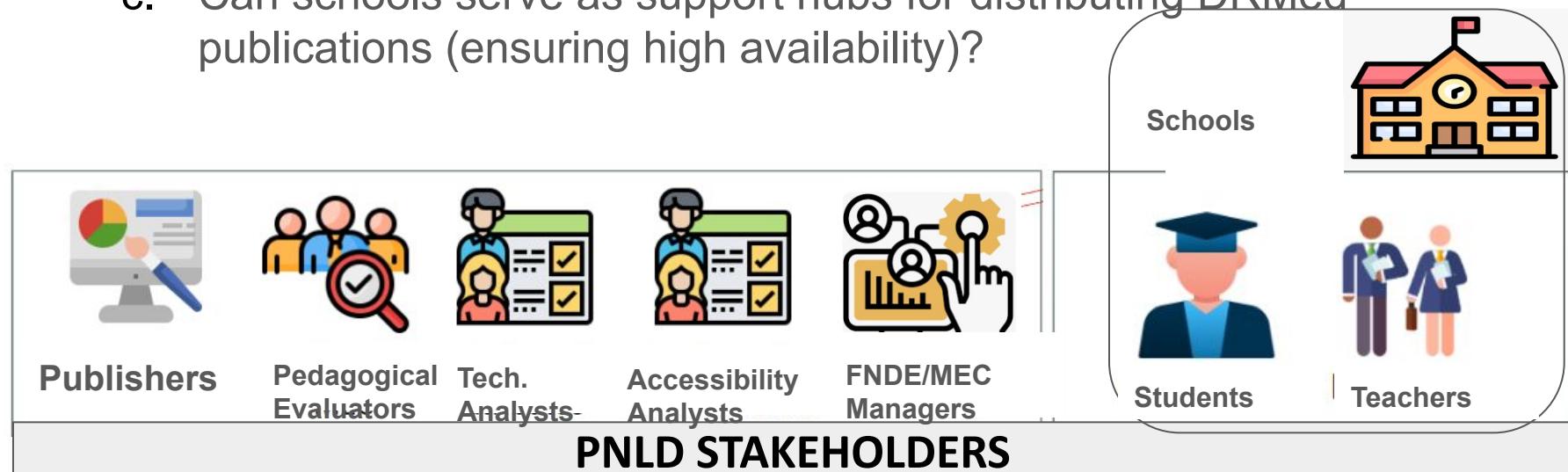


# Refined PNLD Workflow



# The Challenges

- How can we deliver the PNLD digital textbook to end users with the highest quality?
  - a. Accessibility and interactivity in an amplified sense
  - b. How to deal with connectivity limitations?
  - c. Can schools serve as support hubs for distributing DRMed publications (ensuring high availability)?



# A number of publications in which multimedia is already being used

8. Quem não tinha direito à cidadania em Atenas?

Clique no play e acompanhe as informações do vídeo.

DEMOCRACIA DIRETA NO BRASIL

0.02 / 3:43

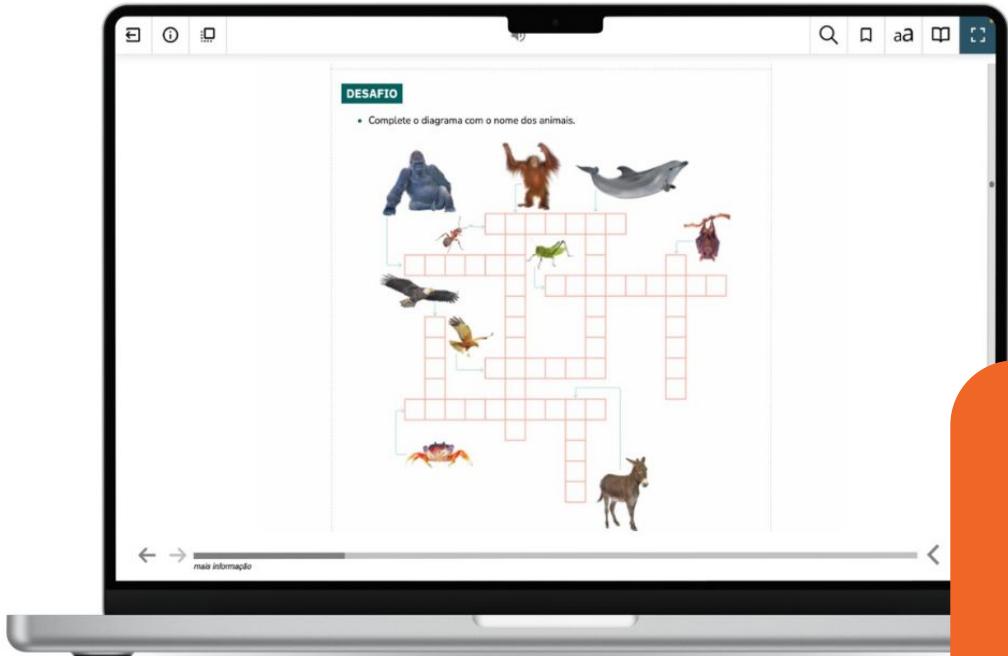
While listening

AUDIO 2 0.09 / 1:10

a. Hi, my name's Sasha Miller. I come from Phoenix, the capital of the state of Arizona, in the southwest of the United States - the country where I was born. I'm 29 years old.  
b. Hello, my name's Bree Smith, but my friends call me "B". I just turned 16. I come from Melbourne, in Australia.  
c. Hi, my name's Emily, but you can call me "Em", if you like! I'm from Manchester, a large city in northwest of England. I'm 25 years old, almost 26... That's because my birthday is tomorrow! So... congrats to me.  
d. My name's Patrick Murphy, I come from Dublin, the capital of the Republic of Ireland, located on the east coast of the country. I'm 60 years old. It is a pleasure to meet you!

2. Now listen to the people and check your answers.  
3. Listen again and number the speakers.  
a) Emily  
b) Sasha  
c) Patrick  
d) Bree

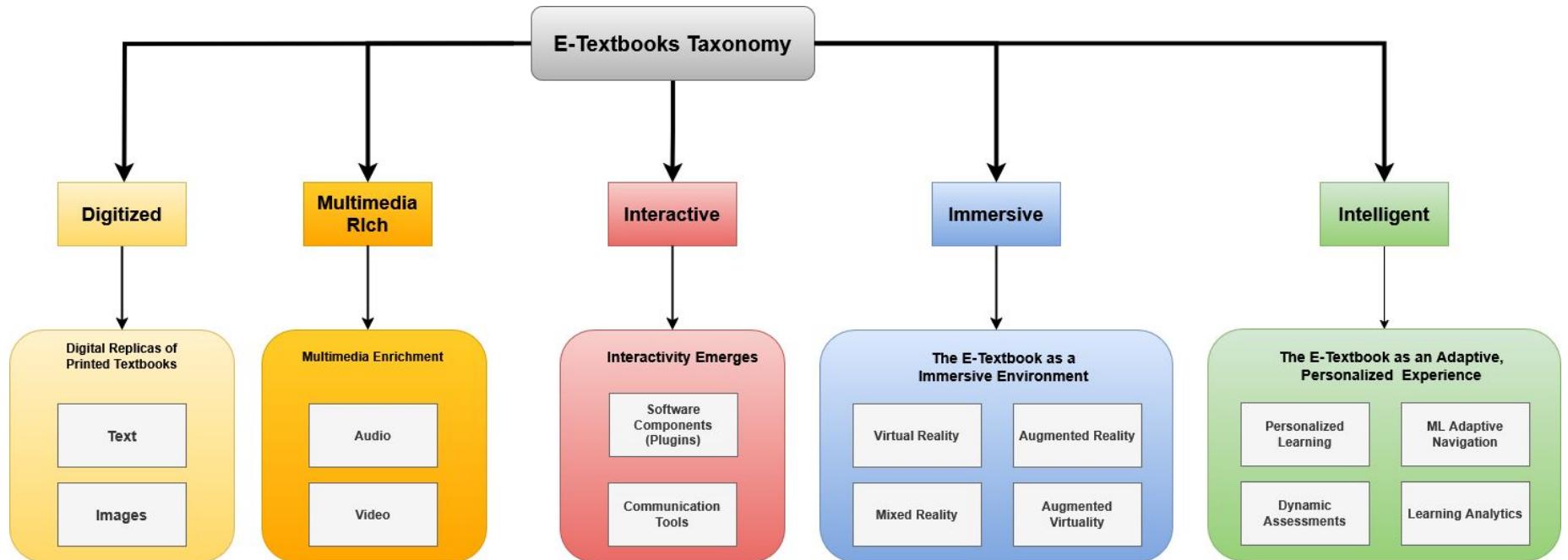
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We still have no  
interactive  
components, through

How can we  
improve and  
foster that  
among  
publishers?

# Our Proposed Taxonomy



**“AN EVOLUTIONARY TAXONOMY FOR DIGITAL TEXTBOOKS:  
TOWARDS INTELLIGENT AND IMMERSIVE LEARNING  
ENVIRONMENTS (EDULEARN 2025)**

*B.J. Duarte da Costa, R. dos Santos Escarpini, B.A. Pimentel, N.J. Tavares  
da Cruz, J. Fusco Lobo, L. Chaves, R. de Amorim Silva*

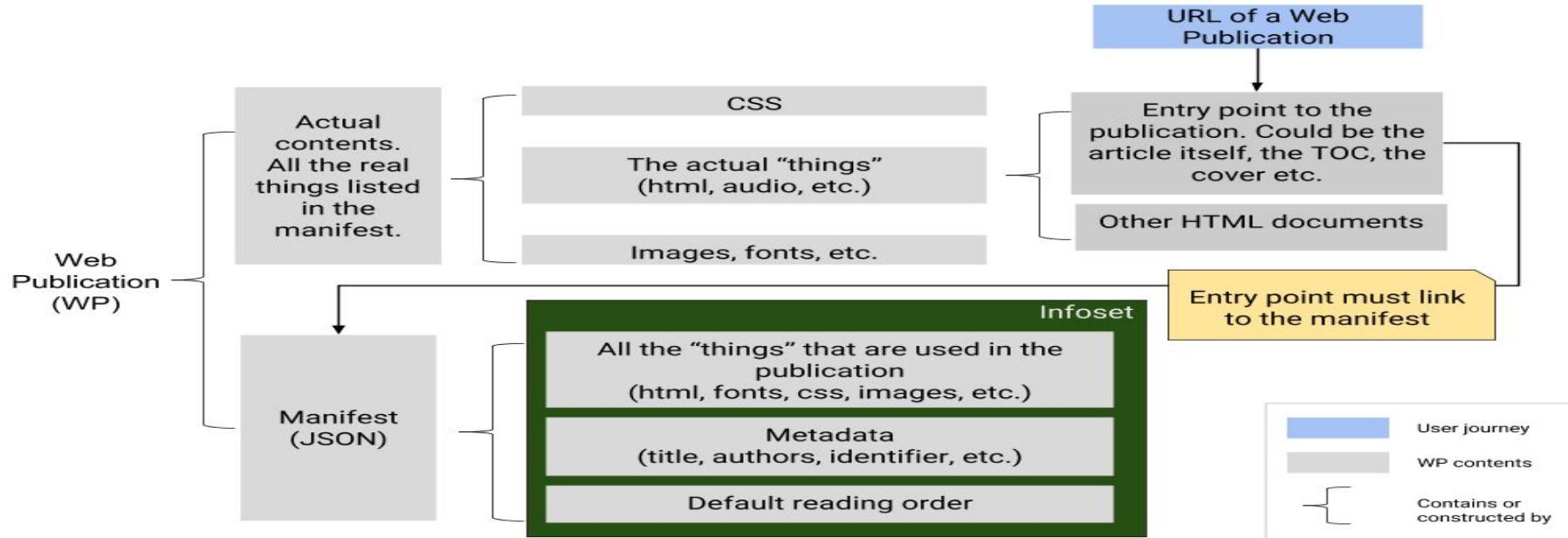


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# Web Publication as a Concept

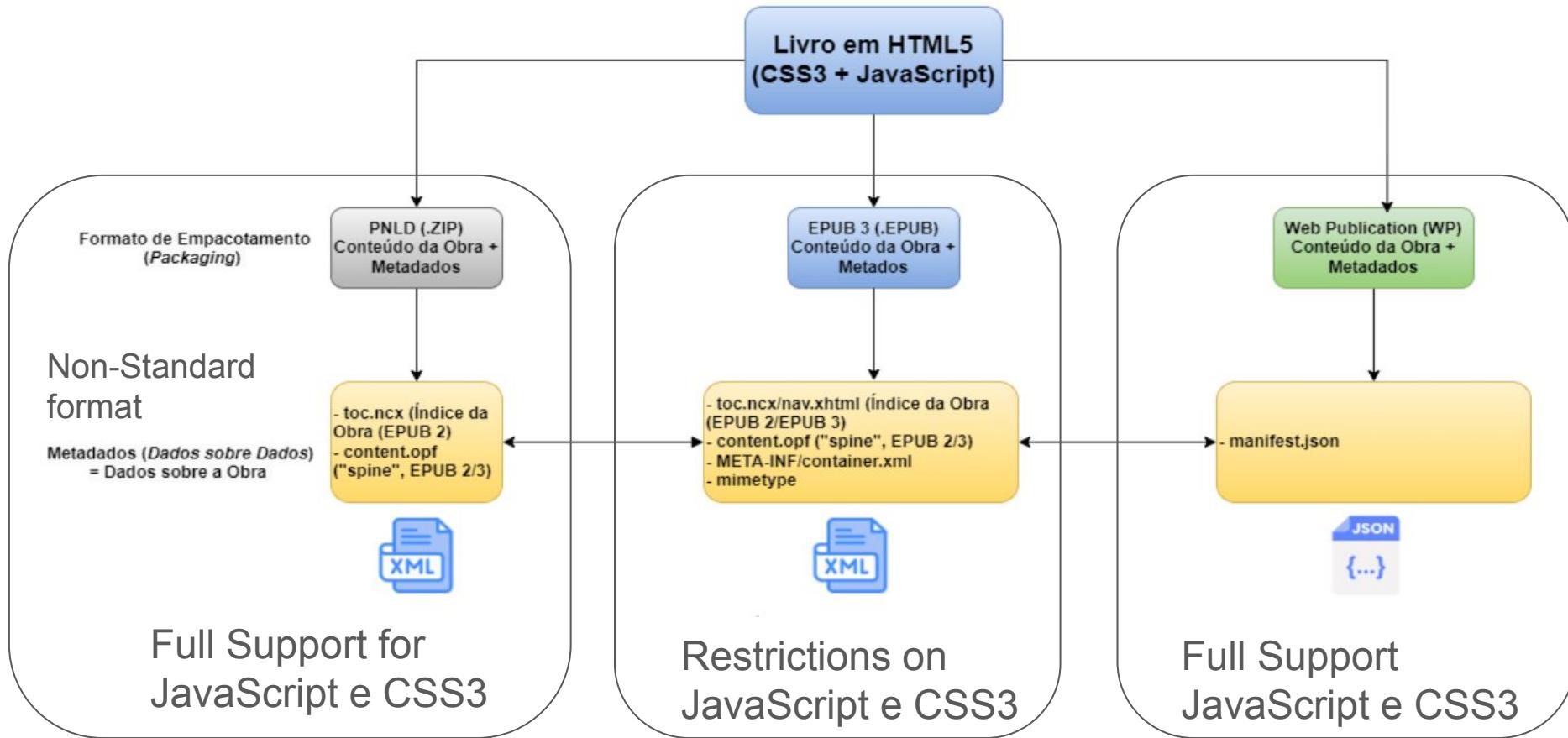
- “A Web Publication (WP) is a collection of one or more constituent resources, organized together in a uniquely identifiable grouping, and presented using standard Open Web Platform technologies”
- <https://w3c.github.io/wpub/#webpub>



# Web Publication as an Implementation

- <https://readium.org/webpub-manifest/>
- A viable implementation that has been incorporated as the PNLD format
- We have been working on tools that will ease the transition of publishers to use this format
- PNLD has a custom format built on HTML5 that contains a hybrid of EPUB 2/3 (content.opf) / DAISY (toc.ncx) metadata
- Our mission is to simplify and make the format as a pure webpub format

# PNLD | Formats



# PNLD | Web Publications as a format

Formato PNLD atual	Adaptado para EPUB	Web Publications
<pre>. └── content       ├── credits.html       └── legal         └── main.html           └── urls.html     └── content.opf     └── cover.jpeg     └── index.html   └── resources     ├── fonts     ├── images     ├── scripts     └── styles     └── videos   └── toc.ncx</pre>	<pre>. └── META-INF       └── container.xml     └── mimetype     └── PNLD       └── content         ├── credits.html         ├── licenses.html         └── main.html         └── readme.html         └── urls.html       └── content.opf     └── cover.jpeg     └── index.html   └── resources     ├── fonts     ├── images     ├── scripts     └── styles     └── videos   └── toc.ncx</pre>	<pre>. └── content       ├── capitulo1.html       ├── capitulo2.html       ├── capitulo3.html       ├── capitulo4.html       ├── capitulo5.html       ├── capitulo6.html       └── capitulo7.html     └── credits.html     └── main.html     └── urls.html   └── cover.jpeg   └── index.html   └── manifest.json   └── resources     ├── fonts     ├── images     ├── scripts     └── styles     └── videos   └── toc.ncx</pre>

# PNLD | Format Expectations

- Requirements for the PNLD are met by Web Publications

	EPUB	Web	Web Publications
Access	Offline	Online Partially offlinable	Online Offline Partial downloads
Protection	DRM Obfuscation	Access control DRM for video	DRM Obfuscation Access control
Progression	Linear	Content-based	Linear
Navigation	Table of contents Search Go to	Content-based URL fragments	Table of contents Search Go to URL fragments



**LIP**

Leitor interativo do PNLD

**The role of the readers as a  
vehicle to PNLD's library of  
protected textbooks**

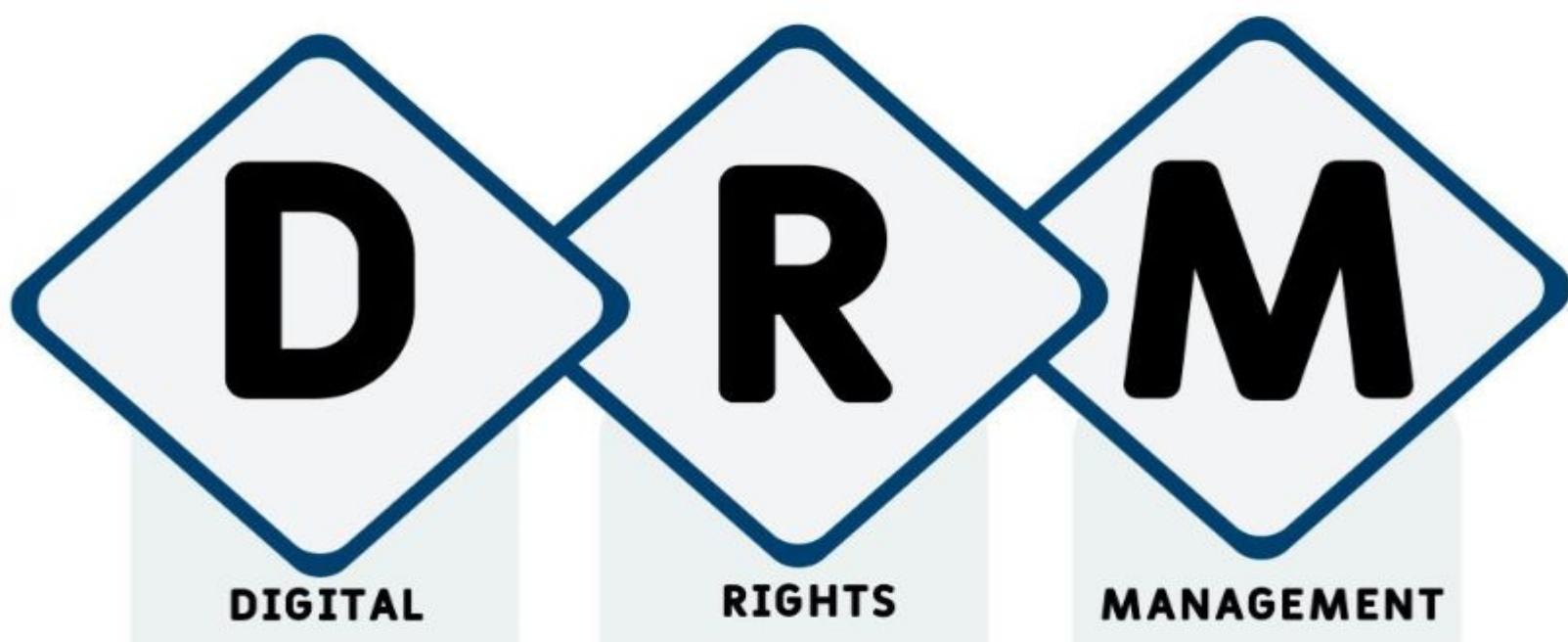
# LIP | Motivation

- Multiplatform Reader: Desktop, Mobile & Web

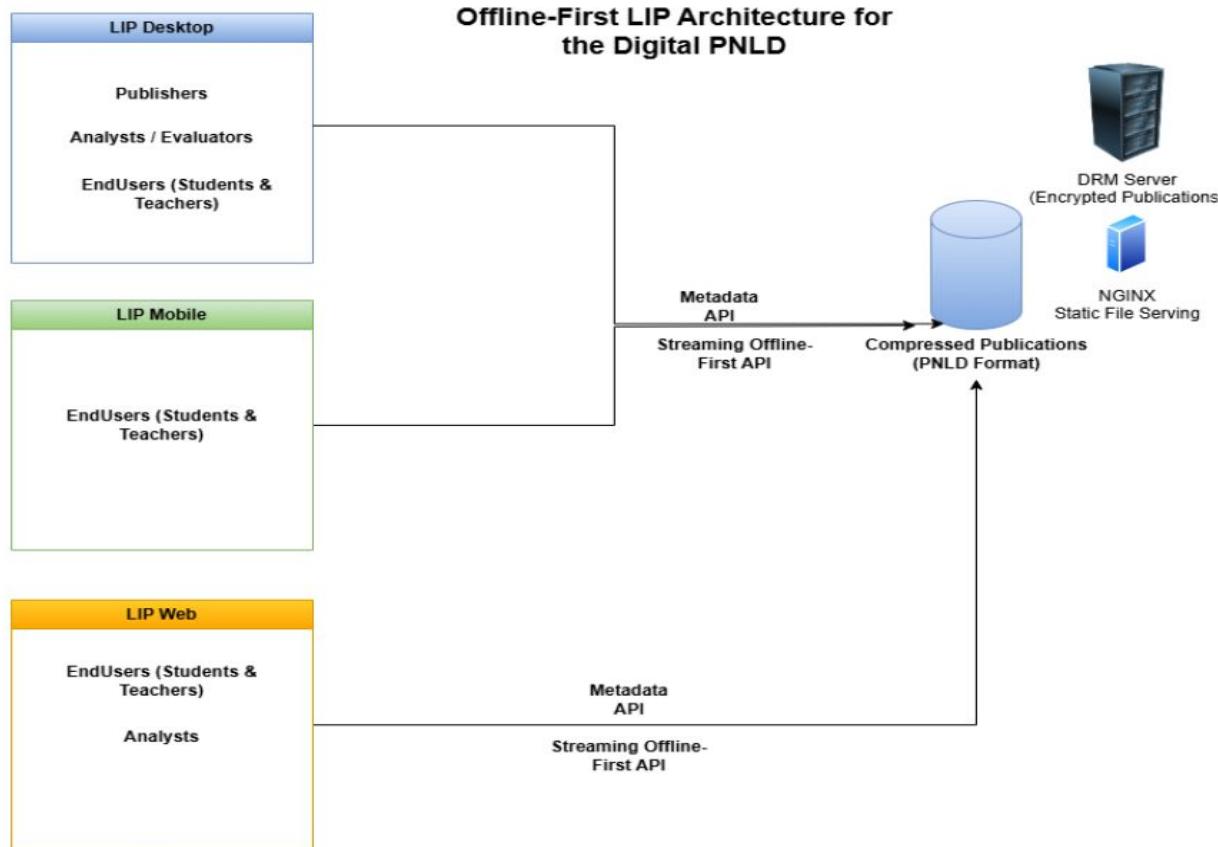


# LIP | Motivation

- DRM-protected publications



# LIP | Architecture



# Challenges & Opportunities

- Consistent rendering of publications across platforms (Desktop, Web and Mobile)
  - It tends to be solved as .webpubs become supported as they should - pure webview rendering with little to no code injections in the readers
- Connectivity / Distribution
  - Partial / progressive loading of publications
  - Being researched on how this can be achieved
  - P2P content-centric delivery networks - <https://ipfs.tech>
- Easing the creation of accessible and interactive to Brazilian publishers - UNICEF's ADT Press partnership
  - <https://www.accessibletextbooksforall.org/>
  - <https://github.com/unicef/adt-press>



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# THANK YOU!

# QUESTIONS?

